Applied Physics A

Materials Science & Processing

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PHYSICS AND ASTRONOMY CLASSIFICATION SCHEME (PACS)

Shortened version for use in classifying papers for Applied Physics

General

02 Mathematical methods in physics
06 Measurement science and metrology
07 Specific instrumentation
- 07.60 Optical instruments and techniques, detection of radiation
- 07.65 Optical spectroscopy and spectrometers
- 07.75 Mass spectrometers and mass-spectroscopy techniques
- 07.80 Electron and ion microscopes and spectrometers; techniques
- 07.85 X-ray and gamma-ray instruments and techniques

Atomic and molecular physics

32 Atomic spectra and interactions with photons
33 Molecular spectra and interactions of molecules with photons
34 Atomic and molecular collision processes and interactions
35 Experimentally derived information on atoms and molecules
36 Studies of special atoms and molecules (macro- and polymer molecules, clusters)

Fundamental areas of phenomenology (including applications)

41 Electricity and magnetism
42 Optics *(see also 78)*
- 42.10 Propagation and transmission in homogeneous media
- 42.20 Propagation and transmission in inhomogeneous media
- 42.30 Optical information, image formation and analysis
- 42.40 Holography
- 42.50 Quantum optics
- 42.55 Laser processes
  - C *Pumping mechanisms*
  - E *Molecular gas lasers* (CO_2, CO, N_2O, *formaldehyde*)
  - G *Excimer lasers*
  - H *Atomic, ionic, and other gas lasers*
  - M *Laser action in liquids and organic dyes*
  - P *Laser action in semiconductors*
  - R *Laser action in solid-state lasers*
  - T *Free-electron lasers*
- 42.60 Laser systems and laser-beam applications
  - B *Design of specific laser systems*
  - D *Laser resonators, cavities, and amplifiers*
  - E *Laser beam deflection and focusing*
  - F *Laser beam modulation, mode locking, and tuning*
- 42.65 Nonlinear optics
- 42.68 Atmospheric optics
- 42.70 Optical materials
- 42.80 Optical devices, techniques, and applications (including fiber and integrated optics)

43 Acoustics *(see also 62)*

Fluids, plasmas, and electric discharges

52 Physics of plasmas and electric discharges

Condensed matter: structure, mechanical and thermal properties

61 Structure of liquids and solids; crystallography
(for surface structure, see 68.35; for thin-film structure, see 68.55)
- 61.10 Determination of structures
- 61.12 Neutron determination of structures
- 61.14 Electron determination of structures
- 61.16 Other determination of structures
- 61.20 Liquid structures
- 61.30 Liquid crystals
- 61.40 Amorphous and polymer materials, glasses
- 61.70 Defects in crystals
- 61.80 Radiation damage and other irradiation effects

62 Mechanical and acoustical properties of condensed matter
63 Lattice dynamics and crystal statistics
64 Phase equilibria, and phase transitions
65 Thermal properties of condensed matter
66 Transport properties of condensed matter (nonelectronic)
- 66.30 Diffusion and ionic conduction in solids

68 Surfaces and interfaces; thin films and whiskers
- 68.10 Fluid surfaces and fluid-fluid interfaces
- 68.15 Liquid thin films
- 68.35 Solid surfaces and solid-solid interfaces (including bicrystals)
- 68.45 Solid-fluid interfaces
- 68.55 Thin films: growth, structure, epitaxy and nonelectronic properties
- 68.65 Layer structures, intercalation compounds, and superlattices: growth, structure, and nonelectronic properties
- 68.70 Whiskers and dendrites: growth, structure, and nonelectronic properties

Condensed matter: electronic structure, electrical, magnetic, and optical properties

71 Electron states
72 Electronic transport
- 72.15 Electronic phenomena in metals and alloys
- 72.20 Conductivity phenomena in semiconductors and insulators
- 72.40 Photoconduction and photovoltaic effects
- 72.50 Acoustoelectric effects
- 72.60 Mixed conductivity and conductivity transitions
- 72.70 Noise processes and phenoma

73 Electronic structure and electrical properties of surfaces, interfaces, and thin films
- 73.20 Electronic surface states
- 73.25 Surface conductivity
- 73.30 Surface double layers, Schottky barriers, and work functions
- 73.40 Interfaces
- 73.60 Electronic properties of thin films

74 Superconductivity
- 74.70 Superconducting materials

75 Magnetic properties and materials
- 75.70 Magnetic films and plates

76 Magnetic resonances and relaxation; Mössbauer effect
77 Dielectric properties and materials
- 77.55 Dielectric thin films

78 Optical properties
- 78.30 Infrared and Raman spectra
- 78.65 Optical properties of thin films
- 78.70 X-ray spectra and positron annihilation

79 Electron and ion emission by liquids and solids; impact phenomena
- 79.20 Impact phenomena (including electron spectra and sputtering)
- 79.40 Thermionic emission
- 79.60 Photoemission and photoelectron spectra
- 79.70 Field emission and field ionization

Cross-disciplinary physics

81 Materials science
- 81.10 Methods of crystal growth and purification
- 81.15 Methods of thin-film deposition
  - Z *Laser deposition methods*
- 81.40 Treatment of materials and its effect on microstructure and properties
  - Z *Laser machining*
- 81.60 Corrision, oxidation, and surface treatments
  - Z *Laser techniques, including ablation*

82 Physical chemistry
- 82.20 Chemical kinetics and chemical reactions
- 82.30 Specific chemical reactions; reaction mechanisms
- 82.40 Chemical kinetics and reactions: special regimes and techniques
  - Z *Laser-induced reactions*
- 82.45 Electrochemistry and electrophoresis
- 82.50 Photochemistry and radiation chemistry
- 82.65 Surface processes
- 82.70 Dispersive systems
- 82.80 Chemical analysis and related physical methods of analysis

84 Electromagnetic technology
- 84.60 Direct energy conversion and energy storage

85 Electrical and magnetic devices
- 85.30 Semiconductor devices
- 85.40 Integrated electronics
- 85.60 Photoelectric and optoelectronic devices and systems
- 85.80 Electrochemical, thermo-EM, and other devices

87 Biophysics (biological effects of radiation)

A classified index for Volumes 1–25 can be found in Appl. Phys. **25**, 367–453 (1981), one for Volume 26–40 in Appl. Phys. A 40/4 (August 1986), and an earlier index for Volumes 1–15 at the end of Appl. Phys. **15** (May 1978)

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